

WHAT IS CLAIMED IS:

1. A process for hydroisomerizing the slurry hydrocarbon liquid produced in a slurry hydrocarbon synthesis reactor in said reactor while it is producing said liquid from a synthesis gas and wherein said slurry in said synthesis reactor is a slurry body comprising gas bubbles and catalyst particles in said liquid, said process comprising:
 - (a) contacting a portion of said slurry from said slurry body with means for removing gas bubbles, to produce a gas bubble reduced slurry;
 - (b) passing a hydrogen treat gas and said gas bubble reduced slurry into and up through a hydroisomerization zone in one or more lift reactors in said synthesis reactor which are at least partially immersed in said slurry body therein, with each said lift reactor containing a hydroisomerization catalyst therein which defines a hydroisomerization zone;
 - (c) reacting said gas bubble reduced slurry and hydrogen in the presence of said hydroisomerization catalyst, at reaction conditions effective to hydroisomerize at least a portion of said liquid and produce a hydroisomerized liquid, and
 - (d) passing all or a portion of said hydroisomerized hydrocarbon liquid back into said slurry body.
2. A process according to claim 1 wherein there is more than one downcomer reactor.

3. A process according to claim 2 wherein at least one downcomer contains noble metal containing hydroisomerization catalyst and wherein at least one other downcomer contains non-noble metal hydroisomerization catalyst.

5 4. A process according to claim 1 wherein circulation of said gas bubble reduced slurry up through said one or more lift reactors is produced at least in part by the lift action of said treat gas.

10 5. A process according to claim 4 wherein said slurry hydrocarbon liquid is intermittently or continuously withdrawn as product liquid from said synthesis reactor, while it is producing said hydrocarbon slurry liquid.

15 6. A process according to claim 5 wherein, in addition to gas bubble removal, at least a portion of said catalyst particles are also removed from said slurry before it is passed into said hydroisomerization zone.

7. A process according to claim 6 wherein said hydroisomerization catalyst comprises a monolithic catalyst.

20 8. A process according to claim 7 wherein said hydroisomerization catalyst is in the form of a monolith.

25 9. A process according to claim 7 wherein said monolithic catalyst comprises a plurality of monolithic catalyst bodies vertically arrayed in said zone.

10. A process according to claim 9 wherein at least a portion of said slurry liquid removed from said synthesis reactor is passed to at least one

upgrading operation comprising at least fractionation and/or one or more conversion operations.

11. A process according to claim 10 herein said gas bubble
5 removal means is immersed in said slurry body.

12. A process according to claim 11 wherein at least a portion of said monolithic bodies are vertically spaced apart in said hydroisomerization zone.

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13. A process according to claim 12 wherein said hydrogen treat gas is passed into said zone through at least two separate gas injection means vertically spaced apart along said zone, each upstream of a monolithic catalyst body.

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14. A process according to claim 13 wherein a static mixing means is located in at least a portion of said spaces between said monolithic bodies.

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15. A process according to claim 14 wherein at least a portion of said hydrogen is injected into said hydroisomerization zone upstream of at least one of said mixing means.

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16. A process according to claim 15 wherein said gas bubbles and particulate solids are removed from said slurry by gas bubble and solids removing means immersed in said slurry in said synthesis reactor.

17. A process according to claim 16 wherein said gas bubble reduced slurry is passed

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into said lift reactor by downcomer means in said slurry body.

18. A process according to claim 17 wherein said gas bubble reduced slurry is passed into said lift reactor by downcomer means in said slurry
5 body.

19. A slurry hydrocarbon synthesis process which includes hydroisomerizing hydrocarbon liquid produced in a slurry hydrocarbon synthesis reactor in one or more lift reactors at least partially immersed in the slurry body
10 in said synthesis reactor while it is producing said liquid from a synthesis gas and wherein said slurry body in said synthesis reactor comprises gas bubbles and hydrocarbon synthesis catalyst particles in said liquid, said process comprising:

15 (a) passing said synthesis gas comprising a mixture of H₂ and CO into said slurry body;

20 (b) reacting said H₂ and CO in the presence of said hydrocarbon synthesis catalyst at reaction conditions effective to form hydrocarbons, a portion of which are liquid at said reaction conditions and comprise said slurry liquid;

(c) contacting a portion of said slurry from said slurry body with means for removing gas bubbles, to form a gas bubble reduced slurry;

25 (d) passing a hydrogen treat gas and said gas bubble reduced slurry into and up through a hydroisomerization zone in said one or more lift reactors in which they react in the presence of a monolithic hydroisomerization catalyst to form a hydroisomerized hydrocarbon liquid of reduced pour point and

wherein said gas reduced slurry passes up through said one or more lift reactors at least in part by the lift action of said treat gas, and

- 5 (e) passing at least a portion of said hydroisomerized hydrocarbon liquid back into said slurry body with which it mixes.

20. A process according to claim 19 wherein said slurry hydrocarbon liquid is intermittently or continuously withdrawn as product liquid from said synthesis reactor, it is producing said hydrocarbon slurry liquid and
10 wherein at least a portion of said product liquid is passed to at least one upgrading operation comprising at least fractionation and/or one or more conversion operations.

15 21. A process according to claim 20 wherein said gas bubble reducing means is at least partly immersed in said slurry body.

20 22. A process according to claim 21 wherein said monolithic hydroisomerization catalyst comprises a plurality of vertically arrayed monolithic catalyst bodies, at least a portion of which are vertically spaced apart

25 23. A process according to claim 22 wherein said hydrogen treat gas is passed into said zone by at least two separate gas injection means vertically spaced apart along said zone, each upstream of a monolithic catalyst body.

25 24. A process according to claim 23 wherein solid particles are also removed from said slurry, before said slurry liquid contacts said hydroisomerization catalyst and wherein said gas bubbles and particulate solids

are removed from said slurry by gas bubble and solids removing means at least partially immersed in said slurry body.

25. A process according to claim 24 wherein a static mixing
5 means is located in at least a portion of said spaces between said catalyst bodies.

26. A process according to claim 25 wherein at least a portion of slurry liquid produced in said reactor and hydroisomerized is passed to at least one upgrading operation.

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27. A process according to claim 26 wherein said upgrading comprises fractionation and/or one or more conversion operations.

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